

Sub  
a1

What is claimed is:

1. A method for displaying an image, comprising the steps of:

providing a reversible image display medium  
5 comprising;  
two substrates opposed to each other with a gap therebetween;

one or more developer accommodating cells formed between the two substrates, each having a periphery  
10 surrounded by a partition wall; and

a dry developer contained in each of the cell(s), the dry developer containing at least two kinds of frictionally chargeable dry developing particles having different chargeable polarities and different  
15 optical reflection densities; and

displaying an image by driving the frictionally charged developing particles having different chargeable polarities in an electrostatic field corresponding to the image to be displayed, wherein  
20 in the image display step, strength of the electric field to be applied to the developer is 0.3 V/ $\mu$ m to 3.0 V/ $\mu$ m.

2. The method according to claim 1, wherein at least one kind of the developing particles among the  
25 dry developing particles are magnetic particles, and a

09087818-111601

magnetic stirring force is applied to the developer by a magnetic field in relation to driving the developing particles in the electrostatic field.

3. A method for displaying an image, comprising  
5 the steps of:

providing a reversible image display medium  
comprising;

two substrates opposed to each other with a gap  
therebetween;

10 one or more developer accommodating cells formed  
between the two substrates, each having a periphery  
surrounded by a partition wall; and

a dry developer contained in each of the cell(s),  
the dry developer containing at least two kinds of  
15 frictionally chargeable dry developing particles  
having different chargeable polarities and different  
optical reflection densities;

displaying an image by applying from outside an  
electrostatic field corresponding to the image to be  
20 displayed and by applying from outside an oscillating  
force to the frictionally charged dry developing  
particles having different chargeable polarities to  
drive the developing particles for image display; and

substantially stopping application of the  
25 oscillating force during the application of the

09987818.111601

electrostatic field after image display.

4. The method according to claim 3, wherein at least one kind out of the two kinds of frictionally chargeable dry developing particles having different chargeable polarities and different optical reflection densities which form the dry developer are magnetic particles; and wherein

the application of oscillating force to the developing particles in the image display step is carried out by application of an oscillating magnetic field; and

the substantial stop of application of oscillating force in the step of substantial stop of application of oscillating force is done by substantial stop of the application of oscillating magnetic field during the application of electrostatic field after image display.

5. The method according to claim 3, wherein the substantial stop of application of oscillating force is conducted after image display and during the application of electrostatic field at 0.5 V/ $\mu$ m or more to the developer from outside.

6. The method according to claim 3, wherein a surface of the image display medium on image observation side is charged to carry a potential

09987818.111601

holding the displayed image after completion of application of the electrostatic field.

7. The method according to claim 6, wherein at least one kind out of at least two kinds of  
5 frictionally chargeable dry developing particles having different chargeable polarities and different optical reflection densities which form the developer are magnetic particles; and wherein

when the surface of the image display medium on  
10 the image observation side is charged to carry the potential holding the displayed image, the charged polarity of the charged potential corresponds to the charged polarity of the magnetic developing particles.

8. A method for displaying an image, comprising  
15 the steps of:

providing a reversible image display medium comprising;

two substrates opposed to each other with a gap therebetween;

20 one or more developer accommodating cells formed between the two substrates, each having a periphery surrounded by a partition wall; and

a dry developer contained in each of the cell(s), the dry developer containing at least two kinds of  
25 frictionally chargeable dry developing particles

having different chargeable polarities and different optical reflection densities;

displaying an image by applying from outside an electrostatic field corresponding to the image to be displayed to the frictionally charged developing particles having different chargeable polarities to drive the developing particles for image display; and charging a surface of the image display medium on image observation side to carry a potential holding the displayed image after completion of application of the electrostatic field.

9. The method according to claim 6, wherein the potential holding the displayed image is 100 V or less in terms of absolute value.

10. The method according to claim 8, wherein the potential holding the displayed image is 100 V or less in terms of absolute value.

11. A method for displaying an image, comprising the steps of:

providing a reversible image display medium comprising;

two substrates opposed to each other with a gap therebetween;

one or more developer accommodating cells formed between the two substrates, each having a periphery

09987818-111601

surrounded by a partition wall; and

a dry developer contained in each of the cell(s),  
the dry developer containing at least two kinds of  
frictionally chargeable dry developing particles

5 having different chargeable polarities and different  
optical reflection densities;

initializing the reversible image display medium  
by stirring the developer in the image display medium  
before image display on the display medium; and

10 displaying an image by driving the frictionally  
charged dry developing particles having different  
chargeable polarities within the above-initialized  
reversible image display medium in an electrostatic  
field corresponding to the image to be displayed.

15 12. The method according to claim 11, wherein  
the initialization is conducted by application of an  
alternating electric field to the developer in the  
medium.

20 13. The method according to claim 12, wherein  
strength of the alternating electric field to be  
applied to the developer is 0.5 V/ $\mu$ m or more.

14. The method according to claim 12, wherein  
frequency of the alternating electric field to be  
applied to the developer is 5 kHz or less.

25 15. The method according to claim 12, wherein

the application of alternating electric field to the developer in the medium is performed to satisfy a condition: (frequency[Hz] of alternating electric field x time[second(s)] for application of alternating electric field)=20 or more.

16. An image forming apparatus which displays an image using a reversible image display medium comprising: two substrates opposed to each other with a gap therebetween; one or more developer accommodating cells formed between the two substrates, each having a periphery surrounded by a partition wall; and a dry developer contained in each of the cell(s), the dry developer containing at least two kinds of frictionally chargeable dry developing particles having different chargeable polarities and different optical reflection densities,

the apparatus comprising:

a device for initializing the reversible image display medium by stirring the developer in the image display medium before image display on the medium; and

an image forming portion for displaying an image by driving the frictionally charged developing particles having different chargeable polarities within the initialized medium in an electrostatic field corresponding to the image to be displayed.

17. The image forming apparatus according to claim 16, wherein the initializing device is one in which the developer is stirred by application of an alternating electric field to the developer in the reversible image display medium.

18. The image forming apparatus according to claim 17, wherein the initializing device applies the alternating electric field having an electric field strength of  $0.5 \text{ V}/\mu\text{m}$  or more to the developer.

19. The image forming apparatus according to claim 17, wherein the initializing device applies the alternating electric field having a frequency of 5 kHz or less to the developer.

20. The image forming apparatus according to claim 17, wherein the initializing device applies the alternating electric field to the developer to satisfy a condition: (frequency[Hz] of alternating electric field) X (time[second(s)] for application of alternating electric field) = 20 or more.

21. A method for displaying an image, comprising the steps of:

providing a reversible image display medium comprising;

two substrates opposed to each other with a gap therebetween;



09987818-111601

one or more developer accommodating cells formed between the two substrates, each having a periphery surrounded by a partition wall; and

5 a dry developer contained in each of the cell(s),  
the dry developer containing at least two kinds of frictionally chargeable dry developing particles having different chargeable polarities and different optical reflection densities, at least one kind out of at least two kinds of developing particles being  
10 magnetic particles; and

displaying an image by applying an electrostatic field corresponding to the image to be displayed to the frictionally charged developing particles having different chargeable polarities in the medium to drive  
15 the developing particles, and

affecting a magnetic field on the developer in the reversible image display medium from outside before and/or in the image display step to apply a stirring force to the developing particles.

20 22. The method according to claim 21, wherein at least one magnetic field-generating member is opposed to the reversible image display medium, and the magnetic field-generating member and the medium are relatively moved to oscillate the magnetic field  
25 strength to be applied to the developer, whereby the

magnetic stirring force is applied.

23. The method according to claim 22, wherein the magnetic field-generating member is opposed to at least one side of the reversible image display medium.

5 24. The method according to claim 22, wherein a surface of at least one magnetic field-generating member and the reversible image display medium are relatively moved in one predetermined direction, and the magnetic field-generating member to be used is one  
10 in which magnetic poles are arranged in the predetermined direction.

25. The method according to claim 22, wherein a surface of at least one magnetic field-generating member and the reversible image display medium are  
15 relatively moved in one predetermined direction and a direction across the predetermined direction, and the magnetic field-generating member to be used is one in which magnetic poles are arranged in the direction across said predetermined direction.

20 26. The method according to claim 22, wherein a surface of at least one magnetic field-generating member and the reversible image display medium are relatively moved in one predetermined direction and wherein the magnetic field-generating member to be used  
25 is one in which magnetic poles are arranged in a

direction at a specific angle to said predetermined direction.

27. The method according to claim 22, wherein a surface of at least one magnetic field-generating member and the reversible image display medium are relatively moved in one predetermined direction and the magnetic field-generating member to be used is one in which at least two rows of magnetic poles are arranged in a direction across the predetermined direction such that in two adjacent rows of the magnetic poles, positions of N and S magnetic poles are displaced from each other in the direction of arrangement of the magnetic poles.

28. The method according to claim 22, wherein the magnetic field-generating members are opposed to both sides of the reversible image display medium, and the magnetic field-generating members are different from each other in the arrangement of magnetic poles.

29. An image forming apparatus which displays an image using a reversible image display medium comprising: two substrates opposed to each other with a gap therebetween; one or more developer accommodating cells formed between the two substrates, each having a periphery surrounded by a partition wall; and a dry developer contained in each of the cell(s), the dry

developer containing at least two kinds of frictionally chargeable dry developing particles having different chargeable polarities and different optical reflection densities, at least one kind out of two kinds of  
5 developing particles being magnetic particles,

the image forming apparatus comprising:

an image forming portion for displaying the image by driving the frictionally charged dry developing particles having different chargeable  
10 polarities within the reversible image display medium in an electrostatic field corresponding to the image to be displayed; and

at least one device for applying a magnetic stirring force by affecting a magnetic field on the developer in the reversible image display medium form  
15 outside to apply the stirring force to the developer before and/or in image display.

30. The method according to claim 29, wherein the device for applying the magnetic stirring force has  
20 at least one magnetic field-generating member which is opposed to the reversible image display medium, and magnetic field strength to be applied to the developer is oscillated by relative movement between a surface of the magnetic field-generating member and the medium.

25 31. The method according to claim 30, wherein

the device for applying the magnetic stirring force has the magnetic field-generating member which is opposed to at least one side of the reversible image display medium.

5           32. The method according to claim 30, wherein the surface of at least one magnetic field-generating member in at least one device for applying the magnetic stirring force and the reversible image display medium are relatively moved in one predetermined direction,  
10           and the magnetic field-generating member has magnetic poles arranged in said predetermined direction.

          33. The method according to claim 30, wherein the surface of at least one magnetic field-generating member in at least one device for applying the magnetic  
15           stirring force and the reversible image display medium are relatively moved in one predetermined direction, and a direction across the predetermined direction and wherein the magnetic field-generating member has magnetic poles arranged in the direction across said  
20           predetermined direction.

          34. The method according to claim 30, wherein the surface of at least one magnetic field-generating member in at least one device for applying the magnetic stirring force and the reversible image display medium  
25           are relatively moved in one predetermined direction,

09987818-11601

and the magnetic field-generating member has magnetic poles arranged in a direction at a specific angle to said predetermined direction.

35. The method according to claim 30, wherein  
5 the surface of at least one magnetic field-generating member in at least one device for applying the magnetic stirring force and the reversible image display medium are relatively moved in one predetermined direction, and the magnetic field-generating member has at least  
10 two rows of magnetic poles arranged in a direction across the predetermined direction such that in two adjacent rows of the magnetic poles, positions of N and S magnetic poles are displaced from each other in the direction of arrangement of the magnetic poles.

36. The method according to claim 30, wherein at  
15 least one device for applying the magnetic stirring force has magnetic field-generating members which are opposed to both sides of the reversible image display medium and which are different from each other in the  
20 arrangement of magnetic poles.